



Towards spatial quantification of soil security – progress and future challenges.

Damien Field (1), Remin Yang (2), Darren Kidd (3), Alex McBratney (1), and Budiman Minasny (1)

(1) The University of Sydney, Sydney Institute of Agriculture, School of Life and Environmental Sciences, Sydney, Australia (damien.field@sydney.edu.au), (2) School of Geography, Jiangsu Normal University, Xuzhou, China, (3) Natural Assets Spatial Intelligence, Department of Primary Industries Parks Water and Environment Tasmania, Australia

The Soil Security framework provides a holistic multi-dimensional assessment to elucidate the long-term sustainability of soil under current and future management options. The dimensions of; capability, condition, capital, connectivity and codification take into account the biophysical, as well as, the socio-economic aspects affecting the utility of soil. Currently, work has been undertaken both in Australia and China to explore the spatial quantification of soil security using a digital soil mapping approach. The biophysical dimensions of capability and condition focus on answering ‘what can this soil do’, and ‘what is the current condition of the soil’. This is demonstrated here by analyzing soil security under agricultural land-use. In this case the capital dimension is only valued from a soil productivity perspective and the dimensions of codification take into account if policies in place that ensure sustainable use of soil, while connectivity is assessed by determining if those managing soil have sufficient expertise. While this preliminary analysis shows that the assessment of soil security through its dimensions would benefit from improvements in the approach to quantifying the dimensions the work demonstrates that it is possible to spatially quantify how secure a soil is and identify areas that would benefit from protection through one or more of its dimensions. The opportunity to do this will be also presented.